

Alexander Brown

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Education

University of Washington - Tacoma

Mechanical Engineering (Bachelor of Science)

Graduation: June 2027

Summary

U.S. Navy veteran and mechanical engineering student with proven test & evaluation experience, achieving 60% improvement in PIV measurement accuracy. Security clearance eligible with hands-on experience in structural analysis, rapid prototyping, and complex systems development spanning mechanical, electrical, and software integration.

Skills

Technical: SolidWorks, MATLAB, Python, LTspice, Arduino, PIVLab, FDM/Additive

Systems and Materials: Thermal systems, Vibration analysis, Fluid mechanics, Composite materials

Leadership & Communication: Team mentorship, Project management, Technical documentation

Experience

President UWT, Society of American Military Engineers - Tacoma, WA

October 2024 - Present

- Managed planning and execution of technical workshops for 40+ engineering students, achieving 30% membership growth while maintaining \$5K operational budget
- Connected 12 students with industry internships through direct networking with Tacoma Public Utilities, Amazon, and other regional suppliers

Hospital Corpsman, U.S. Navy - Various Locations

Aug 2018 - May 2023

- Led process optimization for \$102K medical supply system, reducing operational downtime by 20% through industrial engineering principles and logistics analysis
- Developed safety protocols and hazard documentation for 50+ controlled substances, ensuring compliance with federal safety standards analogous to aerospace quality requirements
- Reduced procedural errors by 30% through systems engineering approach to workflow optimization, demonstrating continuous improvement methodology applicable to manufacturing environments

Projects

Assistant Researcher - Coastal Erosion Mitigation & Seawall Design Analysis

Jul 2025 - Present

- Conducted test and evaluation engineering on scaled 3D-printed prototypes in hydraulic flume systems, validating structural performance against wave loading, reflection, and overtopping conditions
- Achieved 60% improvement in measurement accuracy through innovative Visual Field Architecture (VFA) design, enhancing Particle Image Velocimetry (PIV) test equipment capabilities for aerospace-grade flow visualization
- Applied rapid prototyping and additive manufacturing to iterate through 5 design cycles, reducing model fabrication time by 70% while maintaining dimensional tolerances within $\pm 0.5\text{mm}$

Research and Development - Vibration Analysis of Phase-Change Materials

Feb 2025 - Present

- Designed complete test and evaluation system in SolidWorks for dynamic material characterization, applying Design for Additive Manufacturing (DFAM) principles to achieve $< \$500$ prototype cost
- Applied rapid prototyping to fabricate test fixtures with $\pm 0.1\text{mm}$ tolerances, validating mechanical design through iterative hardware integration and fit-check procedures
- Established quantitative test methodology integrating Arduino-based DAQ, piezoelectric sensors, and oscilloscope for structural dynamics analysis across -20°C to 80°C operational envelope

Mechanical Engineer - 2-Axis Autonomous Turret

Jul 2024 - Present

- Designed and fabricated 2-axis gimbal system in SolidWorks, achieving $\pm 0.5^{\circ}$ pointing accuracy through precision FDM manufacturing and iterative tolerance optimization
- Integrated electrical and software systems using embedded C++ programming, implementing closed-loop servo control with $< 100\text{ms}$ response time for autonomous target acquisition
- Validated mechanical design through environmental testing, ensuring stable operation across $0-50^{\circ}\text{C}$ temperature range and 20Hz vibration tolerance